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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 08/907,182 | 08/06/1997 | SHUNPEI YAMAZAKI | 07977/023002 | 7978 |

26171 7590 11/18/2004

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| EXAMINER | |
|---|---|
| DIAMOND, ALAN D | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1753 | |

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 08/907,182 | YAMAZAKI ET AL. | |
| | Examiner | Art Unit | |
| | Alan Diamond | 1753 | |

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *06 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *26-30,32-55,57-71,73-76,78,79,81-91,93-99 and 103-107* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *81,83-85,87-89,104,105 and 107* is/are allowed.

6)☒ Claim(s) *See Continuation Sheet* is/are rejected.

7)☒ Claim(s) *29, 37, 45, 54, 62, and 70* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 August 1997* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 08/623,336.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *07062004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 6, 2004 has been entered.

### *Comments*

2. The provisional obviousness-type double patenting rejection over the claims of copending application 09/939,767 is moot in view of the fact that there are no method claims in said copending application, and the semiconductor device in the claims of said copending application does not anticipate or render obvious the instant method.

3. The obviousness-type double patenting rejection over the claims of U.S. Patent 6,544,826 (the '826 patent) have been overcome by Applicant's amendment of independent claims 26, 34, 42, 51, 59, 67, 76, 82, and 86 so as to require that the gettering layer comprising phosphorus is formed by a CVD technique. The '826 patent applies its phosphorus to the crystallized semiconductor film using a solution, but not using a CVD technique.

### *Claim Objections*

4. Claim 103 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is

required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 103 does not further limit any of parent claims 26, 34, 42, 51, 59, 67, 76, 82, or 86 because said parent claims already require that the gettering layer is formed by a CVD technique.

***Double Patenting***

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claims 26-28, 30, 32-36, 38-44, 46-53, 55, 57-61, 63-69, 71, 73-76, 78, 79, 82, 86, 90, 91, 93-99, 103, and 106 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-73 of U.S. Patent No. 6,808,968. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method of manufacturing a semiconductor device in the claims of said patent add a metal, such as Fe, Ni, or Pt, to an amorphous silicon film (with no indication in the patent's claims of impurity doping, e.g., it is substantially intrinsic) which is over a substrate; crystallize the semiconductor film; form a semiconductor layer by CVD over the crystallized semiconductor film,

wherein the semiconductor layer contains an impurity element from group 15 of the periodic table, e.g., contains phosphorous as an impurity; gettering the metal from the crystalline semiconductor by a heat treatment; and removing the gettering layer (see, for example, claims 1, 3, 7, 13, and 16 of said patent). Claim 73 of said patent recites various semiconductor devices that can be prepared using the patent's claimed method, and many of these devices would require the forming of a semiconductor junction. Although a photovoltaic device is not listed said claim 73, a photovoltaic device (which has a semiconductor junction) is a typical semiconductor device that could be manufactured using the patent's claimed method. The claims of said patent do not specifically recite features such as the substrate is an insulating substrate, the temperature and time for the heat treatment, the concentration of phosphorous impurity in the semiconductor layer, or using a nitrogen atmosphere for the crystallization and gettering. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used or determined these features so that a crystalline semiconductor with metal removed could be obtained while practicing the claimed method of said patent. While it is noted above that said amorphous silicon film is substantially intrinsic, the use of a boron doped amorphous silicon film would also have been within the skill of an artisan.

***Allowable Subject Matter***

7. Claims 29, 37, 45, 54, 62, and 70 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claims 81, 83-85, 87-89, 104, 105, and 107 are allowed.

9. The following is a statement of reasons for the indication of allowable subject matter: Instant claims 29, 37, 45, 54, 62, and 70 recite that the gettering layer comprises phosphorous silicate glass (PSG) containing phosphorous at a concentration 1 to 30 wt%. The claims of U.S. Patent 6,808,968 (the '968 patent) relied upon above by Examiner suggest a phosphorous-doped silicon layer for the gettering layer, not a PSG layer.

Independent claims 81, 83-85, and 87-89 require introducing a gettering material into a surface of the crystallized semiconductor film within a region of 0.1 to 0.2 micron in depth from the surface of the crystallized semiconductor film. This is not taught or suggest by the claims of said '968 patent.

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patents 5,915,174, 5,956,579, 6,548,370, 6,664,144, 6,670,225, and 6,777,273 are hereby made of record.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond
Primary Examiner
Art Unit 1753

Alan Diamond
November 4, 2004

Continuation of Disposition of Claims: Claims rejected are 26-28,30,32-36,38-44,46-53,55,57-61,63-69,71,73-76,78,79,82,86,90,91,93-99,103 and 106.